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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SHEW, JOHN

ART UNIT

PAPER NUMBER

2664

DATE MAILED: 10/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/819,555

Applicant(s)

CHIU ET AL.

Examiner

John L Shew

Art Unit

2664

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) ____ is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3,7-10,14,20,21 and 29 is/are rejected.
- 7) ☒ Claim(s) 4-7,11-13,15-20,22-28,30 and 31 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Specification

Claim Objections

1. Claim 13 recites the limitation "method as in claim 23". There is insufficient antecedent basis for this limitation in the claim since claim 23 has not been previously defined.

Claim 7 line 8, recites the limitation "using a third rerouting technique" is objected to on the basis that a second rerouting technique has not be defined.

Claim 20 lines 10-11, recites the limitation "using a third rerouting technique" is objected to on the basis that a second rerouting technique has not be defined.

Claim 31 recites the limitation "method according to claim 13". Claim 13 is objected to due to lack of antecedent basis. Claim 31 being dependent on claim 13 also lacks antecedent basis.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 3 are rejected under 35 U.S.C. 102(e) as being anticipated by Skalecki et al.

Claim 1, Skalecki teaches a method for routing traffic in a network comprised of a plurality of links (Abstract lines 1-6) referenced by method of route selection in a packet switching network comprised of at least two links, to selectively off-load traffic from congested portions of the network to portions that are less congested (Abstract lines 6-9) referenced by moving traffic from one link to another to reduce the utilization which equates to congestion level of network resources by each link, comprising identifying which of said links are congested and which of said links are not congested (column 2 lines 14-26) referenced by the determination of the measure of utilization which equates to congestion level of the links, identifying traffic trunks that contribute to traffic of the identified congested network links (FIG. 3A, column 3 lines 40-53) referenced by the identification of links 30a-30c of linkset 30 along with their corresponding utilization levels defined by the data rate, selecting rerouting traffic trunks where each of the

rerouting traffic trunks are traffic trunks that contribute to the traffic of the identified congested network links (FIG. 3A, FIG. 3B, column 3 lines 54-60) referenced by selection of paths 40c and 40f in link 30c of linkset 30 for rerouting traffic, ordering the rerouting traffic trunks in congestion contribution order (column 4 lines 2-21, lines 50-54) referenced by the current bandwidth utilization comparison UC to the projected bandwidth utilization UP and determination of the candidate link with the lowest UP, rerouting portions of the traffic in the rerouting traffic trunks that contribute to the identified congested network links (FIG. 3A, FIG. 3B) referenced by the rerouting of path 40c of link 30c to link 30a and rerouting of path 40f of link 30c to link 30b, based on a predetermined parameter using a second routing technique to reduce the congestion of the network (column 4 lines 21-35) referenced by the use of a second predetermined parameter average projected bandwidth AP to determine the utilization for rerouting.

Claim 2, Skalecki teaches the predetermined parameter is a traffic load parameter (column 4 lines 21-35) referenced by the projected average bandwidth AP, the selecting rerouting traffic trunks comprising generating a minimum traffic off-load volume V_l for each of the identified congested network links $l=1,2,3,\dots,L$ where L is the total number of congested network links (column 4 lines 21-35, FIG. 6) referenced by the equation 3 where the magnitude of the difference in average current bandwidth must exceed the magnitude of the difference in average projected bandwidth with this calculation performed for all other candidate links as shown in flowchart step 102, that brings a traffic load of network link l to below the traffic load parameter (column 4 lines 21-35,

FIG. 6) referenced by the requirement to meet equation 3 wherein magnitude of difference in projected average bandwidth must be less than the magnitude of the difference in current average bandwidth.

Claim 3, Skalecki teaches the selected rerouting traffic trunk is selected from the identified traffic trunks starting with a traffic trunk having a greatest volume of traffic contribution to the traffic of the corresponding congested network link (column 3 lines 40-60) referenced by the selection of paths with the highest utilization represented by link 30c for rerouting.

Claims 7, 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Roberts.

Claim 7, Roberts teaches a method for routing network traffic of a network (column 1 lines 5-8, column 5 lines 41-54) referenced by the management of data transmitted over a computer network using micro-flow descriptors to route the data signals, comprising generating in the event of a single network link failure case $n=1,2,\dots,k$, where k is a number of all the links in the network (column 7 lines 31-32, lines 46-52, FIG. 5, column 11 lines 42-48) referenced by a trunk line failure and subsequent micro-flow rerouting using quantified QoS descriptors for route determination using a flow block table 570 defined for all micro-flows, a traffic road map generated based on a first routing technique (column 12 lines 36-61, Fig. 5) referenced by the flow block containing the

road map of the paths based on the QoS descriptors, identifying one or more network links as congested based on a predetermined parameter (FIG. 9, column 16 lines 31-50, FIG. 3B) referenced by the identification of congestion links through packet discards which is reflected in the predetermined parameter Packet Discard Time Limit field 315, and rerouting portions of the traffic that contribute to the identified congested links using a third rerouting technique to reduce the congestion of the network (column 7 lines 53-67, column 8 lines 1-8, FIG. 3B) referenced by the separate rerouting by micro-flow QoS characteristics to load balance the trunk lines wherein the QoS field define the routing technique.

Claim 8, Roberts teaches identifying traffic trunks that contribute to traffic of the identified congested network links (FIG. 3B, column 16 lines 31-50) referenced by the identification of link congestion by packet loss through the Packet Discard Time Limit field 315, and selecting rerouting traffic trunks where each of the rerouting traffic trunks are traffic trunks that contribute to a non-original traffic of the identified single failure congested network links (column 7 lines 31-32, lines 46-52, FIG. 5, column 11 lines 42-48) referenced by a trunk line failure and subsequent micro-flow rerouting using quantified QoS descriptors for route determination using a flow block table 570 defined for all micro-flows.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts in view of Skalecki.

Claims 9, 10 Roberts teaches a method of routing network traffic using a predetermined parameter wherein the predetermined parameter is a traffic load parameter (FIG. 9, column 16 lines 31-50, FIG. 3B) referenced by the identification of congestion links through packet discards which is reflected in the predetermined parameter Packet Discard Time Limit field 315 determining traffic load.

Roberts does not teach generating a minimum non-original traffic off-load volume, a list of traffic trunks corresponding to each identified link.

Skalecki teaches an alternate predetermined parameter of a traffic load parameter (column 4 lines 21-35) referenced by the projected average bandwidth AP

Skalecki teaches selecting rerouting traffic trunks comprising generating a minimum non-original traffic off-load volume $V_l(n)$ for each of the identified congested network links $l=1,2,3,\dots,L$, where L is the total number of congested network links that brings the

non-original traffic load of network link I to below the traffic load parameter (column 4 lines 21-35, FIG. 6) referenced by the equation 3 where the magnitude of the difference in average current bandwidth must exceed the magnitude of the difference in average projected bandwidth with this calculation performed for all other candidate links as shown in flowchart step 102, that brings a traffic load of network link I to below the traffic load parameter (column 4 lines 21-35, FIG. 6) referenced by the requirement to meet equation 3 wherein magnitude of difference in projected average bandwidth must be less than the magnitude of the difference in current average bandwidth, generating a list of traffic trunks corresponding to each of the identified congested network links where each of the traffic in the traffic trunks in the list contributes to the non-original traffic of a corresponding identified congested network link (FIG. 2, column 3 lines 9-18) referenced by the list of routes through linkset 30 from origination point 12 to destination point 18, selecting a traffic trunk as a rerouting traffic trunk from the list based on its non-original traffic contribution to the traffic of the corresponding congested network (FIG. 3A, FIG. 3B) referenced by the selection of rerouting path 40c from link 30c to links 30a of linkset 30, rerouting a traffic portion of the selected rerouting traffic trunk that contributes non-original traffic to the corresponding identified congested network link from the network to reduce the congestion of the network (column 3 lines 40-60) referenced by the selection of links with the highest utilization represented by paths of link 30c for rerouting.

Skalecki teaches the selected rerouting traffic trunk is selected from the list of traffic trunks starting with a traffic trunk having a greatest volume of non-original traffic

contribution to the traffic of the corresponding congested network link (column 3 lines 40-60) referenced by the selection of links with the highest utilization represented by paths of link 30c for rerouting.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the route selection method of Skalecki to the flow management of Roberts for the purpose of balancing the traffic in a packet switched network.

Claims 14, 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meempat et al. in view of Skalecki et al.

Claims 14, 29, Meempat teaches a multi-protocol label switching (MPLS) device in a network (Abstract lines 1-10) referenced by an apparatus to control call admission in a network using MPLS, comprising a congestion identifying device (Abstract lines 7-9) referenced by the cost metric to track the most congested link, wherein the congestion identifying device identifies based on a predetermined traffic load parameter a congestion of network links (FIG. 3, column 2 lines 15-25, lines 39-45) referenced by the parameter Cost_metric 36 to determine the congestion level at bottleneck links, and a LSP selector device wherein the LSP selector device selects rerouting LSP traffic paths for the identified traffic trunks to reduce the traffic of the congested network links

(column 6 lines 52-61) referenced by the path selector PSEL integrated with MPLS for a LSP traffic path selection by a router.

Meempat teaches the actions of the congestion identifying device the contributing traffic identifying device and the LSP selector device are performed by a computer (column 6 lines 47-61) referenced by the Path Status Processor and Path SElector using processors to implement an algorithm.

Meempat does not teach a contributing traffic trunk identifying device.

Skalecki teaches a contributing traffic trunk identifying device wherein the contributing traffic trunk identifying device identifies traffic trunks that contribute to the congestion of the congested network links (FIG. 3A, column 3 lines 40-54, claim 18 lines 1-5) referenced by the apparatus which identifies the traffic trunk links 30a, 30b, 30c of linkset 30 and their respective utilization associated to congestion.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the route selection method of Skalecki to the load balancing method Meempat for the purpose of measuring utilization levels of links in a packet switched network.

Claims 20, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meempat et al. in view of Roberts.

Claim 20, Meempat teaches a device for routing network traffic of a network (Abstract lines 1-11) referenced by the apparatus in a packet-based network to route traffic using a cost metric, comprising a congestion identifying device (Abstract lines 7-11) referenced by the use of a cost metric to determine congested links, a LSP selector device wherein the LSP selector device reroutes portions of the traffic that contribute to the identified congested links using a third rerouting technique (column 4 lines 41-45, column 6 lines 52-61, column 7 lines 54-67, column 9 lines 1-3) referenced by the path selector PSEL function integrated with MPLS of the router for a LSP traffic path selection based on the cost_metric determination of congestion.

Meempat does not teach generation of a traffic map in the event of a single link failure. Roberts teaches in the event of a single network link failure case $n=1,2,\dots,k$, where k is a number of all the links in the network (column 7 lines 31-32, lines 46-52, FIG. 5, column 11 lines 42-48) referenced by a trunk line failure and subsequent micro-flow rerouting using quantified QoS descriptors for route determination using a flow block table 570 defined for all micro-flows, generates a traffic road map generated based on a first routing technique (column 12 lines 36-61, Fig. 5) referenced by the flow block containing the road map of the paths based on the QoS descriptors, and identifies one or more network links as congested based on a predetermined traffic load parameter (FIG. 9, column 16 lines 31-50, FIG. 3B) referenced by the identification of congestion links through packet discards which is reflected in the predetermined parameter Packet Discard Time Limit field 315.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the MPLS call admission method of Meempat to the flow management of Roberts for the purpose of balancing the traffic in a packet switched network.

Claim 20, Meempat teaches the congestion identifying device identifies traffic trunks that contribute to traffic of the identified congested network links (column 6 lines 52-61, column 7 lines 54-67, column 9 lines 1-3) referenced by the path status processor PSP function using the cost_metric determination for congestion, and the LSP selector device selects rerouting traffic trunks where each of the rerouting traffic trunks contributes to a non-original traffic of the identified congested network links (column 4 lines 41-45, column 6 lines 52-61, column 7 lines 54-67, column 9 lines 1-3) referenced by the path selector PSEL function integrated with MPLS of the router for a LSP traffic path selection based on the cost_metric determination of congestion.

Allowable Subject Matter

4. Claims 4-6, 11-12, 15-19, 22-27, 28, 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Citation of Prior Art

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Patent 6795399, Benmohamed et al. discloses a link capacity computation method.

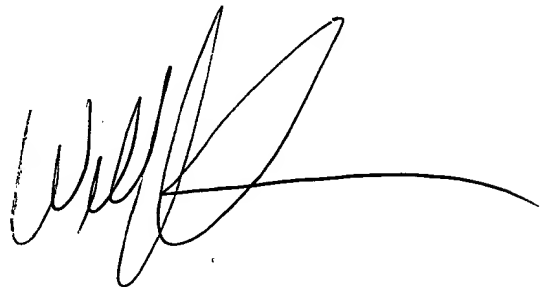
Patent 5689646, Thorson discloses configuration of a network to allow replacement of failed modes with alternate paths.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John L Shew whose telephone number is 571-272-3137. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on 571-272-3134. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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